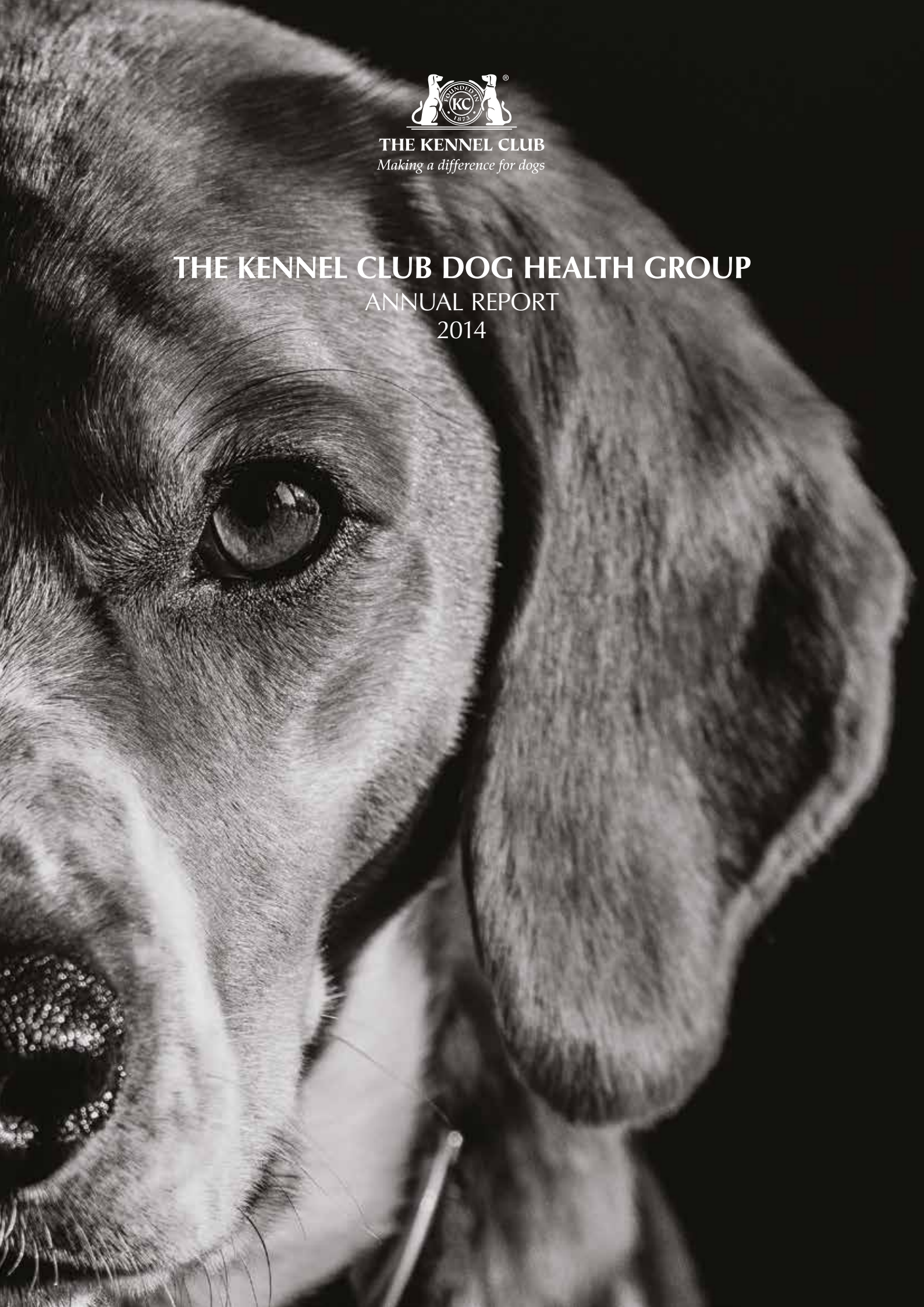

THE KENNEL CLUB
Making a difference for dogs

THE KENNEL CLUB DOG HEALTH GROUP

ANNUAL REPORT
2014

CONTENTS

DOG HEALTH GROUP ANNUAL REPORT 2014 THE KENNEL CLUB

INTRODUCTION

Over the course of the year the Dog Health Group has continued to oversee a number of key initiatives to improve and safeguard health and welfare for purebred dogs. Some of these have been developed by the Kennel Club and some have been in partnership with other organisations. There has been financial support by the Kennel Club Charitable Trust for a number of external health projects, as detailed in this report.

The initiatives introduced in previous years have continued to develop and gain momentum. The systems that have been established to measure progress are now embedded and the comparative data available is beginning to demonstrate clearly what is being achieved.

This report intends to update the information given in previous reports and to highlight some of the main developments. However, full information on all of our health work can be obtained from the Kennel Club website, www.thekennelclub.org.uk

REMIT OF THE DOG HEALTH GROUP

- To develop strategy for the Kennel Club's health work.
- To provide overall co-ordination and monitoring of such work.
- To supervise the *Fit for Function: Fit for Life* campaign and other 'public' campaigns.
- To be responsible for recommending, on advice from the various sub-groups, the requirements for health schemes, the Assured Breeder Scheme requirements and other breeding strategies.
- To produce an annual report on the Dog Health Group's work.

DOG HEALTH GROUP ACHIEVEMENTS IN 2014

KENNEL CLUB CHARITABLE TRUST

The Kennel Club regularly donates approximately two-thirds of the Charitable Trust's income, as well as bearing all the Trust's administrative costs. In 2014 the Trust made grants totalling £412,625 to projects aimed at improving the health of dogs, as follows:

Animal Health Trust	
Support of the Kennel Club Genetics Centre	£243,750
Bearded Collie Breed Council	
Breed health survey analysis	£800
Guide Dogs	
Effects of early environment on adult temperament	£6,660
International Canine Health Awards	
Scientific research into canine health	£80,000
Royal Veterinary College	
Pigmentary keratitis in Pugs	£4,500
Canine epidemiologist (year 1 of 3)	£29,532
Immunophenotype of dogs with immune-mediated haemolytic anaemia	£12,210
University of Cambridge	
Respiratory cycle of brachycephalic dogs	£9,925
University of Glasgow	
p62/sequestome in soft tissue sarcoma	£1,150
University of Liverpool	
Biomarker screening for dilated myopathy in the Dobermann	£23,348
University of Nottingham	
Swabs for research into osteosarcoma in Rottweilers	£750
	£412,625

(The International Canine Health Awards are funded by Vernon and Shirley Hill of Metro Bank)

CLUMBER SPANIEL

Having made significant progress on health and welfare issues and having fulfilled the criteria, the Clumber Spaniel is the second breed to transfer from category 3 to category 2 classification on the Kennel Club's Breed Watch system. A special feature by the Clumber Spaniel Breed Health Co-ordinator is included in this report.

ONLINE JOURNAL

The Kennel Club's online journal, Canine Genetics and Epidemiology, was launched in April 2014 with ten published papers. Edited by two prominent international scientists, Professor Gustavo Aguirre and Professor Bill Ollier, the aim is to publish two additional papers each month, to provide both researchers and the general public with free access to cutting-edge research in canine genetics. The unique extended lay summaries have proved popular with dog owners and breeders, and have even been posted on the Salford Citizen Scientists Programme which reaches 1000 people involved in projects and research, for review and feedback. The Kennel Club PR department works co-operatively with Biomed Central to ensure the journal reaches all interested parties. Biomed Central is a Science, Technology and Medicine publisher of 274 peer-reviewed open access journals. The portfolio of journals spans all areas of biology, biomedicine and medicine and includes broad interest titles, such as BMC Biology and BMC Medicine alongside specialist journals, such as Retrovirology and BMC Genomics. All original research articles published by BioMed Central are made freely accessible online immediately upon publication. Further information can be found at www.cgejournal.org/

KENNEL CLUB HEALTH STRATEGY

During 2014 the Dog Health Group approved a health strategy for the Kennel Club, to ensure that canine health and welfare underpin the multitude of activities of the Kennel Club and to provide a plan against which all Kennel Club activities can be evaluated. The plan details the strategic health aims, outlines how to achieve the strategy and identifies the mechanisms available. This is now shared amongst the Kennel Club's executive management who spearhead the various areas of activity and monitor adherence to the strategy.

PEDIGREE BREED HEALTH SURVEY

The Kennel Club launched the Pedigree Breed Health Survey at Discover Dogs in November 2014. The survey aims to result in the improvement of pedigree dog health and build a stronger understanding of the health of all pedigree dog breeds. It is anticipated that the survey will help to provide a clear picture of the prevalence of current health concerns and enable evidence-based decisions to be made to improve dog health. The survey will provide data on health, breeding and behaviour and allow analysis against results of the Kennel Club's 2004 Purebred Dog Health Survey, thus helping to pinpoint the areas which have seen improvement and areas in which further work is still needed.

CHIARI-LIKE MALFORMATION/SYRINGOMYELIA SYNDROME

The screening programme in place for this condition continues to be actively promoted to encourage more widespread testing amongst the breeds known to be affected. During 2014 the results have been reviewed and discussion took place about funding the assessment of old scans. Test results are routinely included in the Health Test Results Finder on the Kennel Club's website, along with explanatory notes explaining their relevance and offering advice on breeding. CM/SM data is included in Annex A of this report.

© Picture by: Clare Woodall/The Kennel Club Picture Library

SPECIAL FEATURE - CLUMBER SPANIEL

We are grateful to Carol Page, Clumber Spaniel Breed Health Co-ordinator, who has provided the following report. The Clumber Spaniel transferred from category 3 to category 2 classification on the Kennel Club's Breed Watch system in 2014.

INTRODUCTION

The Clumber Spaniel is the oldest recognised breed of spaniel and takes its name from Clumber Park in Nottinghamshire where its origins can be traced back over 200 years. The two World Wars had a huge impact on the breed as it was hard to feed kennels of dogs during these times, especially the larger breeds, and many were destroyed. As a result the numbers dwindled dramatically. In the post-war years, until the mid 1960s, the Clumber went into a decline in popularity when its fate was in the hands of a few dedicated breeders who managed to maintain the excellent qualities of the breed. Numbers have gradually increased and stable numbers of puppies are registered each year.

Today the breed still has a dedicated following and they have to be thanked for improvements that have been made with health issues. Support for the Club's health surveys, in using the health screening schemes that are available and contributing the results of those not published and being aware that if a Clumber is overweight or exaggerated in any way then it can lead to health issues, has enabled us to demonstrate that today's Clumbers are a generally healthy bunch.

The Clumber Spaniel Club has been in the forefront of health awareness, actively addressing breed related issues for over 25 years. The data collected and active health programmes that have been undertaken are showing results in today's dogs. The data amassed provides the evidence about the true state of the breed's health, particularly that which relates to the Breed Watch points of concern.

The Clumber Spaniel has always been a numerically small breed and annual registrations currently range between 160 and 230, and in 2003 the Kennel Club identified the Clumber Spaniel as a Vulnerable British Breed. Low numbers means a small gene pool which can limit the speed of improvement on health issues. Areas of concern highlighted by the Kennel Club Breed Watch include: a tendency to overweight; excessive loose facial skin with conformational defects of the upper and/or lower eyelids which can impact on eye health; weak hindquarters; and ear irritation.

CHRONOLOGY OF PROGRESS

The Club held the first International Breed Seminar in 1987 specifically for "Hereditary Defects in the Clumber Spaniel". Since then the International Breed Seminars have been held every 3 years, rotating between the UK, United States & Sweden and always focusing on health issues. This has enabled the formation of strong links through which all data gathered on health matters can be shared on an international basis for the benefit of the breed.

In 1991 the Club set up a working party to examine the state of health within the breed and the first health survey was conducted; this was repeated ten years later in 2001 to determine whether changes had occurred. Results from both surveys were published.

In 2003, the Club appointed Health Officers and also met with the Kennel Club to address health issues in the breed which resulted in an amendment to the Breed Standard Eye Clause. This year also saw the addition of a health page on the Club's website. This has now been developed so that today results of all health testing and past surveys together with general health information can be accessed.

2009 saw more progression on health matters. A Health & Welfare Sub Committee was formed, a Breed Health Coordinator appointed and the third health survey was carried out. The Clumber Spaniel Club has for many years recommended eye testing for breeding stock. It was aware that Clumber Spaniels were being eye tested but as the breed is not listed for any Schedule 1 conditions the results are not published. Therefore in 2009 the Club established a voluntary database for the results to be recorded and this is published on the Club website, together with a list of forthcoming eye testing sessions.

In 2009 the Kennel Club undertook its global review of Breed Standards and Club representatives met with the Kennel Club to agree a revised standard. The top weight limit for dogs was reduced at the request of the Club. The Kennel Club also introduced the Code of Ethics for breed clubs registered with the Kennel Club, to which the following breed specific clauses were added:

- Clumber Spaniels should only be bred from stock believed to be as free as possible from known serious hereditary defects. At all times improvement of the breed should be the primary consideration.
- Stud dog owners should satisfy themselves as to the suitability of the bitch.
- It is recommended that all KC/BVA health screening schemes appropriate for the breed be used to establish the health of breeding stock prior to being bred from.

A Breeding Survey was conducted in 2011, targeted at all who had registered litters in 2006-2010. This survey came about following breeding problems recorded in the 2009 Health Survey and published figures stating the Clumber Spaniel was one of the top five breeds requiring caesarean sections at whelping. It achieved a 46% response rate, however this only represents 20% of the successful litters bred and registered during this period. Responses indicated that 70% of matings were successful and produced live puppies. However 46% of births (20 out of 43) required a caesarean, over half (11) of which were required because of uterine inertia; 4 had a physical blockage and there were 5 known absorptions. 73% of puppies born had no problems; the most common abnormality in puppies was the presence of an umbilical hernia (13% affected).

2014 proved to be another productive year. A Breed Health Plan, developed in 2013, was circulated in January 2014. This will be reviewed annually to take into account any changes in breed health. A Breed Health Survey was carried out, based on the surveys carried out in 1991 and 2001, but expanded to allow for more information to be gathered about the conditions reported. This will allow for better comparison of the results with past surveys than has been possible previously. The Club continues to subsidise eye tests for all Clumbers in 2014 and hosted the International Breed Seminar, where attention was focused on the work being done on reducing inbreeding coefficients.

Inbreeding coefficients are a new area of concern for the breed and research that will enable specific recommendations is only just emerging. Initial analysis shows the main cause for concern to be popular sire syndrome and therefore the Club will raise awareness of this and recommend that owners of stud dogs limit their use and hence their influence on the breed. In 2010 Bateson's Independent Inquiry into Dog Breeding recommended that "over a five year period no dog should produce more offspring than 5% of the total number of puppies registered, for that period". From 2008 - 2012 a total of 1066 Clumber Spaniels have been registered giving an average of 213 per year; using the Bateson recommendation then no dog should produce more than 54 puppies in a five year period. Breeders must also take into account the resultant COI for any litter and strive to at least be below the current breed average. This can now be easily researched on the KC website and breeders are encouraged to use this facility.

SPECIFIC HEALTH INITIATIVES

The breed is fortunate that the principal health testing schemes that are recommended for the Clumber Spaniel, hip scoring and eye testing, are operated under the KC/BVA schemes.

1. HIP DYSPLASIA

Today more than 800 dogs have been screened for hip dysplasia, which is extremely good for such a numerically small breed and the results show that much progress has been made. Hip scoring is a requirement for Kennel Club Assured Breeders.

© Picture by: Andy Biggar/The Kennel Club Picture Library

CLUMBER SPANIEL: 5-YEAR ROLLING TRENDS IN HIP SCORING BETWEEN 1992 AND 2014

Year End	No. of scored dogs in the period (% of registered dogs)		No. of dogs registered in the period	5-year Rolling Mean (Median)		Range of scores in the period	No. of dogs with scores of 10 or less (% of total scored)		No. of dogs with scores>30 (% of total scored)	
1996	138	(14.3)	967	38.4	(33)	0 - 93	11	(8.0)	81	(58.7)
1997	117	(12.2)	957	37	(33)	0 - 97	11	9.4)	64	(54.7)
1998	96	(10.9)	877	37.7	33)	7 - 96	7	(7.3)	52	(54.2)
1999	86	(11.3)	759	38.3	(33)	7 - 99	8	(9.3)	49	(57.0)
2000	74	(9.8)	690	34.6	(27.5)	8 - 99	7	(9.5)	35	(47.3)
2001	61	(9.3)	659	34.6	(22.5)	6 - 99	7	(11.5)	26	(42.6)
2002	61	(9.2)	663	32.9	(23)	6 - 99	10	(16.4)	27	(44.3)
2003	64	(9.6)	670	28.8	(15.5)	6 - 89	18	(28.1)	24	(37.5)
2004	83	(11.5)	723	27.4	(15)	5 - 91	24	(28.9)	28	(33.7)
2005	83	(10.9)	765	26.3	(14)	5 - 91	26	(31.4)	27	(32.5)
2006	109	(12.1)	901	25.3	(14)	5 - 94	34	(31.2)	32	(29.4)
2007	130	(13.6)	954	23.7	(12)	5 - 94	42	(32.3)	30	(23.1)
2008	157	(15.4)	1018	22.9	(13)	5 - 94	53	(33.8)	36	(22.9)
2009	185	(17.8)	1037	24.5	(13)	4 - 93	65	(35.1)	47	(25.4)
2010	219	(19.0)	1150	23.7	(13)	0 - 86	79	(36.1)	52	(23.7)
2011	243	(21.4)	1138	24.3	(13)	0 - 106	88	(36.2)	62	(25.5)
2012	256	(24.0)	1066	24.1	(13)	0 - 106	93	(36.3)	67	(26.2)
2013	250	(22.4)	1115	25	(18)	0 - 106	101	(40.4)	61	(24.4)
2014	245	(18.4)	1330	22	(11)	0 - 106	110	(44.9)	48	(19.6)

2. ELBOW DYSPLASIA

A growing numbers of Clumbers have also been screened for elbow dysplasia, 56 dogs tested with 86% achieving a 0 score.

3. PYRUVATE DEHYDROGENASE PHOSPHATASE 1 DEFICIENCY

PDP1 is an enzyme deficiency identified in both Clumber and Sussex Spaniels. The lack of the enzyme leads to a failure of the PDH complex, which is responsible for helping to rid the body of waste products from metabolism. When this complex does not function properly, the dog suffers from extreme exhaustion after very limited exercise. PDP1 deficiency can lead to an early death in affected dogs. Testing was made possible by the introduction of a DNA test from the Animal Health Trust in 2007, with support of £4500 by the Kennel Club Charitable Trust. From the results of all dogs tested we have the following results:

170	Dogs have been tested clear		1063	Dogs have been registered hereditarily clear
4	Dogs have tested positive as carriers		0	Dogs have tested as affected
1242	Known status for Clumbers	=	0.32%	Incidence rate

To date, only four carriers have been identified and these are in a related group which would indicate this is not a serious problem for the breed at present. However the results provide a known status for just half of the UK population hence testing is recommended for all breeding stock. PDP1 tests are carried out by Animal Health Trust and PDP1 testing is a recommendation for Assured Breeders.

4. EYE HEALTH

In 2012 eye health was targeted. The Club financially supported eye testing and held an eye testing session in conjunction with the Championship Show. Professor Peter Bedford carried out the eye tests and 41 Clumbers were tested on the day. Those who were unable to attend this session are encouraged to have their dog's eyes tested and to forward a copy of the certificate for the database. Professor Bedford spoke after completing the eye testing, he stated that many of the dogs had too much exposure of the eye, probably stemming from a long term acceptance of "showing haw", although he had also seen some very good eyes and therefore it was within the breed to improve the health of the eye. There was a marked increase in the number of Clumbers being eye tested in that year.

Certificates issued under the BVA Eye Scheme:

2006	2007	2008	2009	2010	2011	2012
13	8	18	30	18	30	79

The subsidy was repeated in 2013 and 2014 and the scheme was extended to include non members' dogs at half the rate of that given to members. We are seeing new dogs being tested in addition to some being tested annually, so it is a positive step forward for the breed. The Club recommends that all Clumber Spaniels being bred should hold a current eye certificate and others should be tested at regular intervals to monitor eye health; this is recommended to be at 2, 6 and 10 years of age.

Analysis of our eye test database is not particularly flattering, we knew it would be a 'warts & all' exercise, however without it we would have no evidence at all about the eye health of the breed. It does provide a good base line for the eye health of today's dogs and in due course it will be able to show improvement. Most of the 'failures' are for the adnexal conformation and are either euryblepharon or mild ectropion; many would say that the loose lower lids are a typical Clumber eye as it has been for many decades. Indeed the Breed Standard Eye Clause states "Acceptable to have some haw showing but without excess". Many would say we have made progress and moved away from the extreme exaggeration that was previously prevalent.

Relatively few serious conditions have been noted by the BVA and as some dogs have been tested annually they may be included twice within these figures.

Sightings reports:

2009	5 with entropion and 1 with a post posterior subscapular cataract.	(Total 6)
2010	3 cases of distichiasis, 3 entropion and 1 ectropion.	(Total 7)
2011	several comments on macropalpebral fissure but only once corneal disease associated	
2012	distichiasis 2 cases, entropion 4 cases, ectropion 2 cases, nuclear cataract 3 cases, other cataract 1 case	(Total 12)

The Club is now committed to supporting eye testing and the clinic at the Championship Show has become an annual event. Eye testing is a recommendation for Assured Breeders.

The Club held a meeting to discuss eye health within the breed and this was followed by a survey being circulated to as many Clumber Spaniel owners as possible to gauge opinion on the ideal head and eye shape. It is acknowledged that excessive facial skin will have a detrimental effect on eye shape and therefore the two must be considered together. Therefore, in 2013 a pilot consultation on head and eye conformation was carried out. This was circulated to as many Clumber owners as possible.

There was a disappointing response with only 24 forms returned. However it was clear that a less exaggerated head and eye form was preferred. Examples 8, 1, 4, 7 & 5 were most favoured.

Those receiving the form in hard copy received it in black & white and we did receive feedback that the quality of the images made it difficult to assess. We are now collating a much larger range of images to carry out a more extensive survey and we have one photographer responsible for all the pictures, so that we will have better uniformity and standard of image.

Example 1

Example 2

Example 3

Example 4

Example 5

Example 6

Example 7

Example 8

Example 9

Example 10

The eye screening is a large step towards addressing the Breed Watch concern regarding the head and eye conformational defects; however eye shape is also affected by head conformation and while we believe that the extreme heavy heads have been consigned to the past, we are progressing the head and eye consultation within the breed to establish acceptable limits. It is agreed that we must have healthy eyes although we do not wish to lose breed type. It is important that the change is gradual and measured so that we do not bring in other problems.

In mid 2014 there were 137 eye tests recorded on the database, from 102 different dogs (some dogs have been tested more than once) and the earliest are from 2005; of these, 97 have been screened under the KC/ BVA/ ISDS Eye Scheme and 5 under the AHT & ECVO Eye Schemes. Since then a further 26 certificates have been received.

5. WEIGHT

In 2013 the Club ran a survey to establish the status of the weight of Clumber Spaniels. This was in direct response to the KC Breed Watch concern regarding dogs being overweight.

Owners were asked to have their dogs' weight recorded by their vet who also graded the dogs according to a Body Condition Score, where the animal was classified as emaciated, thin, optimum, overweight or obese.

The Club provided a chart for the Body Condition Score with the form, so that all vets were working to the same standard. There were a limited number of results but we believe it represented a good cross section of the population. Forms were returned for 66 dogs and a large majority of dogs are described as of optimum weight. The average weight for dogs was found to be 28.97kg and for bitches was 25.37kg.

[Breed Standard: Size: Ideal weight: dogs: 29.5 - 34 kgs (65 - 75 lbs); bitches: 25 - 29.5 kgs (55 - 65 lbs).]

Two new ongoing surveys into breeding and life spans were also launched in 2013; these may be downloaded from the Club's website or hard copies can be requested. Both will allow for information to be gathered on a regular basis and will be reported within the Club's annual Breed Health Report.

6. EARS

The final Breed Watch concern, ear irritation, we firmly believe is a matter of husbandry. Most breeds with a hanging ear are more susceptible to ear problems and probably to about the same extent.

JUDGES' EDUCATION

Judges play a critical role in the development of a breed as the dogs they promote are most likely to have a significant influence on the breed. Therefore it is essential that all judges are fully prepared for their role. In 2013 the Club decided to introduce two levels of seminar. Level 1 is required for inclusion on the B judging list, and aims to give candidates a greater 'hands on' education with experienced mentors. Level 2 is run according to the Kennel Club guidelines and is needed for the A3 judging list. Since the Breed Standard was revised, the Club invites all judges on the A1 list to attend so that they can be updated.

When assessing the Clumber Spaniel all aspects of the dog must be evaluated. The Clumber Spaniel Club provides a "Guide to Judging the Clumber Spaniel" to all candidates attending its Breed Judging Seminars, which sets out information on interpreting the Breed Standard and assessing the Clumber Spaniel. In addition, judges must also be aware of the points of concern as listed by the Kennel Club in Breed Watch; it is felt that these issues are of greatest concern in the breed at present and therefore require additional emphasis. Accordingly the club has developed specific judging guidance for future seminars.

THE FUTURE

The Club is determined to continue improving the health of the breed; by gathering data, through health surveys and education. It is also pleased to see the increasing participation of owners and breeders in all of these areas. Those dedicated to the breed are working tirelessly to ensure that the breed is fit for function today and in the future.

SUB-GROUP ACTIVITY 2014

ACTIVITIES HEALTH AND WELFARE SUB-GROUP

REMIT

- Contribute towards guidance, advice and opinion to the Kennel Club's Activities Sub-Committee, based on clinical veterinary experience and the latest available scientific research.
- Proactively review the available scientific research and bring any relevant information or findings to the attention of the Sub-Committee for discussion and action where appropriate.
- Recommend areas for further research and investigation in order to address issues raised by the Sub-Group or the Activities Sub-Committee, and; to define and scope the parameters for any research recommended.

The Activities Health and Welfare Sub-Group (AHWSG) has continued to identify and proactively pursue areas of research it considers to be beneficial to the welfare of the canine athlete. The sub-group aims to adopt an evidence-based approach to making recommendations for improving regulations and guidelines for the activity disciplines (i.e. Agility, Obedience, Working Trials and Heelwork To Music). In 2014, a range of research projects and tasks were completed involving members of the sub-group and invited experts from other bodies, including the Animal Health Trust and Royal Veterinary College. A brief overview of the key research projects conducted in 2014 is given below:

HEALTH SURVEYS

In addition to the agility health questionnaire carried out in 2013, similar health surveys have been conducted and completed for obedience, heelwork to music and working trials.

INTERNATIONAL AGILITY FESTIVAL 2014 SURVEY

A survey was conducted to identify dog related incidents on the day of an agility show (this added to the information gleaned from the 2013 survey completed at the same event). The aim of this work is to put into context the number of competitive runs vs. incidents and injuries reported in other surveys. A similar survey will be conducted in 2015.

CODE OF PRACTICE FOR DOGS PARTICIPATING IN CANINE ACTIVITIES

A code of conduct has been introduced for the activity disciplines covering agility, obedience, working trials and heelwork to music. The code of conduct aims to provide guidance to practitioners, trainers, owners and handlers to ensure a dog's welfare takes precedence over the demands of training, preparation for competition and when taking part in competitive and non-competitive canine activities.

KINEMATICS OF JUMPING DOGS IN RESEARCH

A range of research has continued into investigating the kinematics of jumping dogs throughout 2014, this work has largely been conducted under the supervision of Nottingham Trent University and the University of East London.

In addition to the above, the annual Kennel Club Canine Sports Science Seminar now falls within the remit of the AHW Sub-Group. The 2014 seminar was once again well attended.

The sub-group currently consists of a range of experts (veterinary surgeons, researchers, lecturers, discipline experts, Kennel Club staff) and frequently invites external experts to help with research. The sub-group is indebted to these experts for their continued support and assistance in meeting its wide-ranging aims and objectives. The sub-group would also like to thank Dr Jo Ireland of the Animal Health Trust for her work in conducting the statistical analysis of the data collected from the agility, obedience and the heelwork to music questionnaires.

ASSURED BREEDER SCHEME [ABS] SUB-GROUP

REMIT

- To act as an impartial unit which provides for the participation of all parties significantly concerned with the Kennel Club ABS.
- To advise on the formulation of policy matters relating to the operation of the scheme.
- To oversee the running of the ABS, with particular regard to the performance of the processes of admitting, monitoring and excluding breeders from the scheme, as well as the receipt and evaluation of puppy buyer feedback.
- To make recommendations as to the husbandry aspects of the ABS and to put into operation those health screening requirements/recommendations agreed by the DHG and in liaison with breed clubs/councils.
- To oversee the use of scheme finances.

ACHIEVEMENTS

BREED SPECIFIC REQUIREMENTS AND RECOMMENDATIONS

A number of changes to the breed specific requirements and recommendations of the ABS have been implemented. The addition of one clinical test and five DNA tests as requirements; the addition of two clinical tests and two DNA tests as recommendations; two DNA tests and one clinical test were changed from recommendations to requirements. In addition, one welfare aspect was added as a recommendation. The latest list can be found by visiting www.assuredbreeders.com and clicking on 'Breed-specific Requirements and Recommendations'. Any breeds with recent adjustments are marked with an asterisk.

ABS VISITS

More than 2,200 Assured Breeders were visited during 2014, exceeding the target set as a result of new protocols brought in which require all members of the scheme to be visited before they can register puppies under the ABS. These visits were carried out in line with guidelines laid down by the United Kingdom Accreditation Service (UKAS) from which the Kennel Club received accreditation in 2013. As of 2014, all breeders applying to join the ABS must be visited by a Regional Breeder Assessor (RBA) before their application can be considered.

REGIONAL BREEDER ASSESSORS

In order to meet the increased demand for visits, the network of RBAs expanded considerably in 2014 with an additional four full-time RBAs and seven part-time RBAs being recruited. At the time of writing, the team consists of six full-time assessors supported by thirteen volunteer RBAs. A number of formal training days were held during the year for these RBAs, to ensure a consistent standard for members.

ABS MEMBERSHIP

Overall membership of the ABS as at 1 January 2015 stood at 6,690, which constitutes a drop of 1,694 members on the previous year. A total of 1,096 breeders resigned from the scheme during 2014, which was not wholly unexpected as membership renewal fees were increased from £10 to £30 at the beginning of 2014, the first fee increase since the ABS began in 2004. Tighter rules regarding visits also contributed to the downturn in membership. In addition to this, 116 breeders were suspended from the scheme in 2014. A further 488 memberships expired – this administrative category includes members who have died or altered their membership format (eg after divorce) or not paid their membership renewal fee for over three years.

SUB-GROUP COMPOSITION

The composition of the sub-group represents all relevant parties involved in the breeding and selling of dogs and assures impartiality of the ABS on strategy and policy, certification and evaluation and as such includes representation from puppy buyers, dog trainers, breeders, the veterinary profession and the Kennel Club. A further two members were appointed during 2014 - one who works for the Trading Standards Office and one who has experience of analysing health strategies. It was agreed at the end of 2014 to add a further two voting members to the sub-group, which will bring the total to ten.

Assured Breeders are now required to have their puppies permanently identified, either by microchip or tattoo or DNA profile, prior to sale. It is also now a requirement that they will have their puppies vet-checked before being sold. It was also agreed that Assured Breeders must have a veterinary health plan for their dogs as agreed with their veterinary surgeon.

During the year, the Advisory Council on Welfare Issues of Dog Breeding issued a breeding standard after extensive consultation with the Assured Breeder Scheme, endorsing much of the good practice already contained in the standard adopted by Kennel Club Assured Breeders.

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BREED STANDARDS AND CONFORMATION SUB-GROUP

REMIT

- To advise on conformation related health issues as they relate to Breed Standards.
- To work with breed clubs/councils and other organisations on specific conformation related health issues.
- To liaise with Kennel Club departments and committees on judges' involvement, training and monitoring related to health issues.

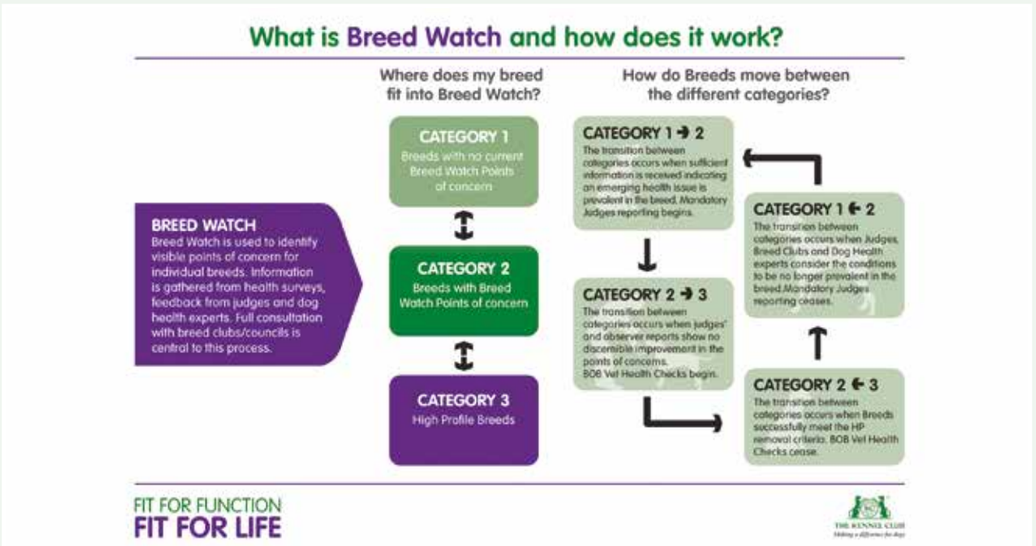
ACHIEVEMENTS

BREED WATCH

Breed Watch is an important resource which provides up to date information on visible health conditions and exaggerated conformational issues that are detrimental to the health and welfare of dogs. The online tool also serves as an 'early warning system' to help identify emerging points of concern for individual breeds. Breed Watch classifies the Kennel Club recognised breeds into categories 1, 2 and 3. Further information on Breed Watch can be found at: www.thekennelclub.org.uk/services/public/breed/watch/

In 2014, to continue to improve the health and welfare of pedigree dogs and with the aim to regularise and broaden the scope of information gathering to incorporate all breeds, the Kennel Club enhanced Breed Watch with a number of improvements, which are summarised as follows:

- Breed Watch is a 3 tier process involving all Kennel Club recognised breeds. This process clearly demonstrates how the visible health of breeds is monitored and how breeds are added and removed from Breed Watch. (See diagram for further information).
- Judges are at the heart of improving the visible health of pedigree dogs. For 2014 all judges at Championship Shows had the opportunity to report on any visible conditions or exaggerations that they considered to be detrimental to the health and welfare of dogs. Mandatory judges' reporting encompassed both category 2 and 3 breeds and for judges of all other breeds, an optional form is included in the back of the judging book.



MONITORING BY JUDGES OF CATEGORY 2 AND 3 BREEDS

The programme of obtaining reports from the category 2 and 3 breed judges at Championship Shows continued throughout 2014 with over 1200 forms completed.

Every judge of a category 2 and 3 breed scheduled at Championship Shows in 2014 was requested to complete a breed specific report giving their opinion on the health and well-being of exhibits shown under them. As a result of the information collected from judges' forms, the Dog Health Group is able to provide more valuable feedback to breed clubs and will be contacting Breed Health Co-ordinators in 2015 to provide them with a summary of the information collected throughout 2014.

The Dog Health Group is grateful to judges for submitting constructive and informative reports and to observers who have given their time to watch individual breeds.

OPTIONAL HEALTH MONITORING FORMS

Following the Breed Watch enhancements in January 2014, an Optional Health Monitoring Form features in all Judging Books at Championship Shows. The Optional Health Monitoring Form is used by judges to report a health or welfare concern about any breed.

In 2014 the Kennel Club received 300 Optional Health Monitoring Forms. In the main, judges gave positive comment on the health of the breed judged and only a small number highlighted a health or welfare concern in a category 1 Breed. The Kennel Club will continue to record the information provided by judges on health monitoring forms in 2015.

BREED WATCH EDUCATION DAY

The first Breed Watch Education Day was held in February 2014. Over one hundred CC judges attended five different workshops on what judges should be looking for in movement, eyes, skin, body conditioning and mouth and dentition.

Workshops on the day were held by a range of specialists: experienced judges, Mr Frank Kane and Ms Annette Oliver, Professor Sheila Crispin, Mr Nick Blayney and Dr Ron James. There was also an informative talk on health monitoring forms and the reporting of visible conditions or exaggerations that judges consider to be detrimental to the health and welfare of dogs.

The Breed Watch Education Day was designed to support developments made by the Kennel Club in the way the health of pedigree dogs is monitored, part of which involves providing all judges at Championship shows with the opportunity to report on any visible conditions or exaggerations that they consider to be detrimental to the health and welfare of dogs.

VETERINARY HEALTH CHECKS

During 2014 a total of 332 dogs passed a veterinary health check at a General or Group Championship Show for a Best of Breed or Champion title award. Only 8 awards were not confirmed. The Kennel Club would like to thank the owners/exhibitors of category 3 breeds for the continued co-operation with veterinary health checks at General and Group Championship Shows.

VISUAL HEALTH ASSESSMENT TEMPLATE & DATA COLLECTION GUIDANCE

In 2014 the Kennel Club published the Visual Health Assessment and Data Collection Guidance, with the purpose of providing assistance to breed representatives who wish to design a visual health assessment for their breed. A copy of the guidance is available on the Kennel Club website.

Many category 3 breeds have an existing visual health assessment or health scheme in place and therefore the Kennel Club considered that it would be useful to those category 3 breeds without a visual health assessment to provide a template form and guidance on how to collect the information recorded.

Visual health assessments are a useful tool to enable the owner of a dog to receive a veterinary surgeon's opinion on the visible health of their dog. A veterinary surgeon is usually required to assess the eyes, skin, mouth and dentition, ears, breathing, body condition and movement of the dog, and record all of their findings on the visual health assessment form. This information is useful to category 3 breed representatives recording information on the health of their breed.

FUTURE WORK

- A Breed Watch Education Day will take place in early 2015 for judges at any level of experience. The day will include interactive workshops covering eyes, skin, body conditioning, dentition and mouths, muscle tone and movement. Attendees will have the opportunity to spend time in small groups with experienced Championship Show judges who will describe how they apply the 'Fit For Function' ethos in the show ring.
- Several breed specific educational workshops will take place covering a number of health and welfare concerns for different breeds.
- Health monitoring for all breeds at Championship Shows will continue in 2015.
- Veterinary health checks at Championship Shows will continue for category 3 breeds.
- A health education guide is being developed to provide further guidance and information on a number of health and welfare concerns.

GENETICS AND HEALTH SCREENING SUB-GROUP

REMIT

- To advise on strategy for development of health screening (clinical/DNA) tests.
- To advise on which of the above should be requirements or recommendations in the Kennel Club Assured Breeder Scheme (ABS).
- To advise on breeding and registration issues to protect or enhance genetic diversity.
- To set up review processes on effectiveness of health screening schemes.
- To provide scientific input, where appropriate, to breeding strategies on phenotypic issues.
- To monitor progress on external data collection and surveillance.

ACHIEVEMENTS

KENNEL CLUB GENETICS CENTRE

The centre celebrated its fifth anniversary in 2014. The centre was created to combine the resources and expertise of the Kennel Club and the Animal Health Trust (AHT) with the aim of benefitting thousands of dogs - both individuals and whole breeds. By developing essential tools, minimising the risk of breeding affected puppies and designing breeding programmes which improve overall health of breeds, the Kennel Club Genetics Centre has helped dog breeders improve the health of their dogs by avoiding inherited diseases in their breeds.

The Kennel Club Charitable Trust invested £1.2 million into the Centre over the 5 years since it opened in 2009. Since then, and led by Dr Cathryn Mellersh and Dr Sarah Blott of the AHT, the centre has:

- Collected and stored DNA samples from 11,000 dogs from 170 different breeds
- Undertaken genome-wide association studies using DNA samples from 1,461 dogs of 25 different breeds
- Identified 10 unique mutations responsible for inherited disorders known to affect 29 different breeds and developed DNA tests which have been used to test more than 38,000 dogs through the AHT's DNA testing facility

To continue this vital work, the Kennel Club Charitable Trust has committed £1.6 million to the Kennel Club Genetics and Cancer Centres at the AHT over the next five years, helping to further accelerate research into inherited diseases affecting dogs. Reports from both centres are given in annexes C and D.

MATE SELECT

In addition to the mutation detection work, the centre has helped the Kennel Club to develop Mate Select, an online resource designed to assist breeders in selecting an appropriate mate for their dog by offering a range of services, including inbreeding coefficient calculators and the health test results finder.

At Crufts 2014, scientists from the Kennel Club Genetics Centre helped demonstrate the next phase of Mate Select, which gives dog breeders and owners access to Estimated Breeding Values (EBVs) for hip dysplasia in fifteen breeds and elbow dysplasia in five breeds. These breeds account for more than 80,000 Kennel Club registrations per year, so these EBVs will initially be available for more than a third of all Kennel Club registered dogs.

EBVs use data from the BVA/KC Hip and Elbow schemes to calculate an inheritance 'risk factor' for each dog and will help reduce the risk of inheriting hip and elbow dysplasia more efficiently than by using individual elbow and hip scores alone. These calculations use pedigree information to link hip and elbow scores for an individual dog with that of all its relatives, allowing a more accurate selection. Complex inherited disorders such as hip and elbow dysplasia are influenced by environmental or external factors and EBVs strip these away and estimate only the genetic component of these conditions.

EBVs were developed with scientists at the Animal Health Trust, and the Roslin Institute and Royal (Dick) School of Veterinary Studies at the University of Edinburgh, and will help breeders of pedigree dogs make sensible and informed choices for breeding, to ensure that they have the best possible chance of producing healthy and happy puppies.

In addition to a new EBV resource, Mate Select underwent a review of the way in which it calculates the annual breed average inbreeding coefficient for each breed. Prior to July 2014, the breed average calculations were based on all dogs recorded by the Kennel Club during the previous year. This included imported dogs, dogs that form part of an overseas pedigree but are not necessarily registered with the Kennel Club, dogs born one year and registered the next, and dogs registered late (over a year old). Following feedback from users, the Kennel Club has reviewed and recalculated the COIs on Mate Select to reflect just those dogs born and registered within the UK in a given year. In future, this calculation will be carried out each June and will generate the annual breed average using Kennel Club registered dogs born in the UK between January and December of the previous year. Using this data will provide a more effective means of monitoring yearly change than by using the average of all recorded dogs in each breed. Further information can be found at www.thekennelclub.org.uk/mateselect.

NEW HEALTH PROGRAMMES

Many of the recommendations and discussions within the Genetics and Health Screening Sub-Group have been focused on ways to receive robust data from new sources, and more effectively utilise data currently held. One example of this was the establishment of new Health Programmes, which it is hoped will be published in 2015.

The first health programme to be established, with the enthusiastic collaboration of the Dalmatian Clubs, is the publication of BAER test results of Dalmatian puppies. Responsible breeders have for a number of years screened their litters using Brainstem Auditory Evoked Response (BAER) testing, to ascertain the hearing status of the puppies in the litter. Up until now, the results of BAER testing have not been centrally collated and results of individual tested dogs have not been published. For this reason, the Kennel Club has been working with the Dalmatian Breed Clubs to establish an official BAER health programme testing scheme for the breed. Results from testing centres can be forwarded directly to the Kennel Club where they will be recorded in the tested dog's registration database, making them available for publication via the Health Test Result Finder. It is hoped once this official health programme is in operation in January 2015, other breeds that routinely use BAER testing on their dogs will wish to set up similar recognised schemes for their breed.

All participating dogs will need to be Kennel Club registered and microchipped, to ensure verification of the dog being screened. In addition to providing useful information on an individual dog's health to breeders, owners, and puppy buyers, it is hoped the data collected from this programme will further assist in research into hearing loss.

Increasing access to more health data via Mate Select's Health Test Results Finder took a leap forward with the proposal of new criteria for the acceptance of additional Health Schemes. As always, the development of the Kennel Club's database as being a robust source of information was paramount. The Health Schemes criteria include provisions to ensure that any new Health Scheme developed or proposed must include requirements such as permanent identification of animals undergoing the scheme, appeals processes, quality controls, high standards of testing/screening by suitable persons, and be ultimately to the benefit of dog health.

INTERNATIONAL PARTNERSHIP FOR DOGS

In continuing efforts to improve the quality and quantity of the collection of health data, the Kennel Club has been working with the International Partnership for Dogs (IPFD) to work towards standardising DNA testing services and produce informative guidance to support dog breeders and owners. In addition, formalising criteria for the acceptance of new health scheme proposals, and guidelines for the use of control schemes will all work towards growing Mate Select and the Health Test Results Finder into an increasingly comprehensive, centralised data resource.

OTHER INITIATIVES

During the year, the sub-group also made the following recommendations to the Dog Health Group:

- The sub-group supported many breed-specific health initiatives - including developing standardised control scheme guidance.
- The sub-group developed and recommended a set of health scheme criteria to improve data capturing from non-official, but reliable canine health schemes (such as international schemes) to identify their significance within wider health initiatives.
- The sub-group celebrated the success of Canine Genetics and Epidemiology (an online research journal) for improving access to canine specific health and welfare research to the veterinary and research community, as well as the lay-person.
- The sub-group discussed different ways of supporting canine-focused external scientific conferences in genetics and behaviour, and projects such as Vet Compass, www.rvc.ac.uk/vetcompass to improve access to research across all stakeholders, to the benefit of all dogs.

CONCLUSION

The 2014 Dog Health Group Annual Report aims to highlight the main achievements, ongoing projects and future direction for the group's work in driving forward the Kennel Club's firm commitment on canine health and welfare. The Kennel Club is extremely grateful to all who contribute to this work, from donations to the Kennel Club Charitable Trust through to breed health co-ordinators, judges, observers, show veterinary surgeons and those who form the membership of the Dog Health Group and its sub-groups.

ANNEX A

HEALTH TESTS

Annual summaries of health data generated by BVA/KC health schemes and official Kennel Club DNA testing schemes.

BVA/KC HIP DYSPLASIA SCHEME

Data Calculated to 01/11/2014

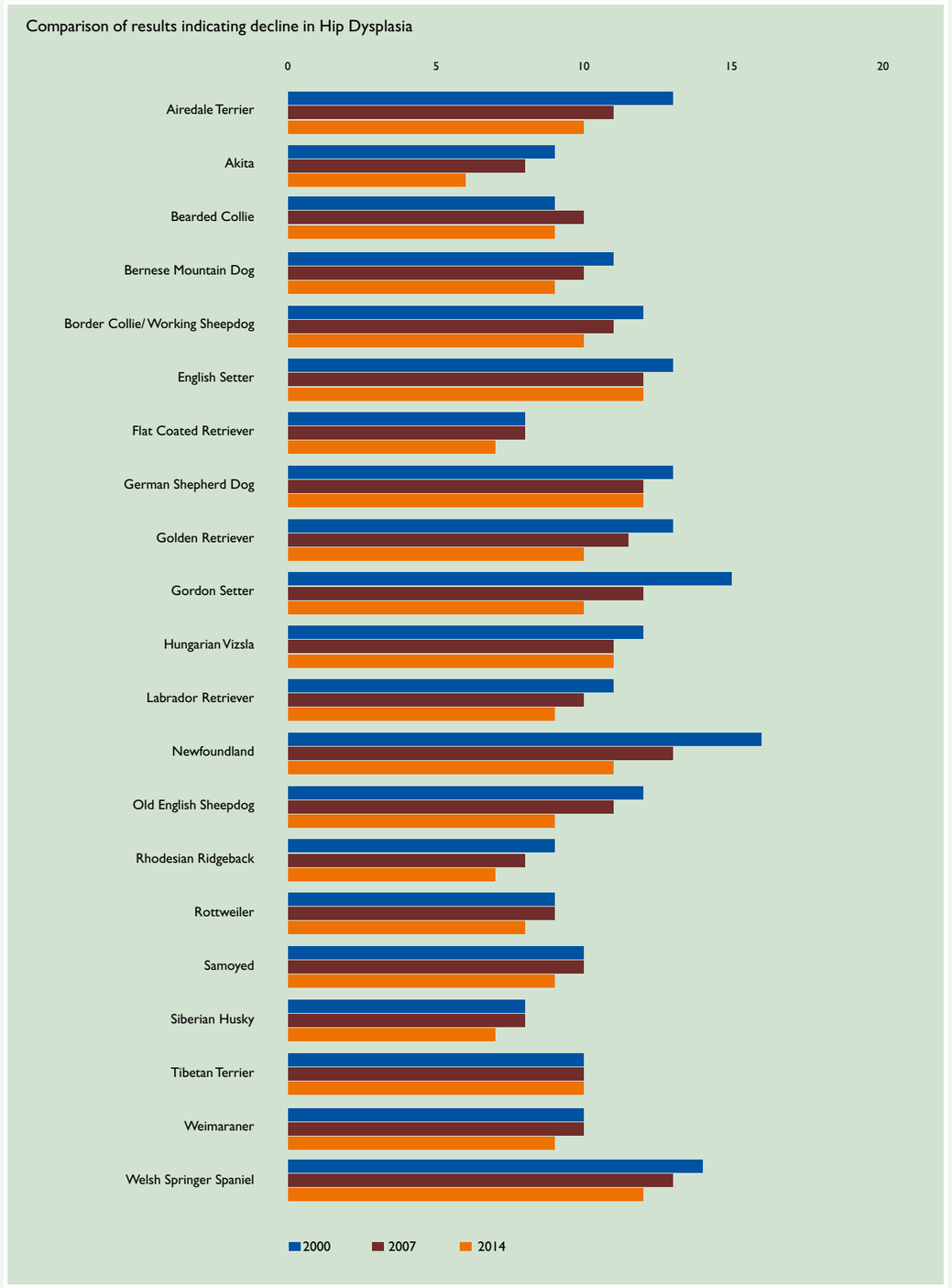
'Five year Rolling Median Scores' are maintained for the breeds that have a high throughput of annual scoring. The five year rolling median is derived from dogs scored in the previous 5 years. So, the 2000 5-year median represents the median of the dogs scored between 1st November 1995 and 31st October 2000. For the 2001 5-year median, the start date moves on by a year as does the end date, and so on.

In previous years this data has been presented as a 5-year rolling mean, but this has been changed to median to be in keeping with the most up to date BVA/KC recommendations.

For further information by breed please refer to www.thekennelclub.org.uk/vets-researchers/dog-health-group-annual-report/

5-YEAR ROLLING MEDIAN HIP SCORES FOR THE MAJOR BREEDS USING THE SCHEME

Breed	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Airedale Terrier	13	12	12	11	11	11	11	11	11	12	11.5	11	11	11	10
Akita	9	9	9	8	8	8	8	8	7	7	6	6	6	6	6
Bearded Collie	9	10	10	10	10	10	10	10	9	9	9	9	9	9	9
Bernese Mountain Dog	11	11	10	10	10	10	10	10	10	9	9	9	9	9	9
Border Collie/Working Sheepdog	12	11	11	11	11	11	11	11	11	11	11	10	10	10	10
English Setter	13	13	13	13	13	13	13	12	12	12	12	12	12	12	12
Flat Coated Retriever	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7
German Shepherd Dog	13	13	12	12	11	11	12	12	12	12	12	12	12	12	12
Golden Retriever	13	13	12	12	12	12	12	11.5	11	11	11	11	11	11	10
Gordon Setter	15	15	15	13	13	13	13	12	12	12	11	11	11	11	10
Hungarian Vizsla	12	12	12	11	11	11	11	11	11	11	11	11	11	11	11
Labrador Retriever	11	11	10	10	10	10	10	10	9	9	9	9	9	9	9
Newfoundland	16	16	16	14.5	14	13	13	13	12	12	12	12	11	11	11
Old English Sheepdog	12	12	12	11	12	11	11	11	10	10	9	9	9	9	9
Rhodesian Ridgeback	9	9	9	8	8	8	8	8	8	8	8	8	8	7	7
Rottweiler	9	9	9	8	9	9	9	9	8	8	8	8	8	8	8
Samoyed	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9
Siberian Husky	8	8	8	8	8	8	8	8	8	8	8	8	8	8	7
Tibetan Terrier	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Weimaraner	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9
Welsh Springer Spaniel	14	14	14	13	13	13	13	13	12	12	12	12	12	12	12

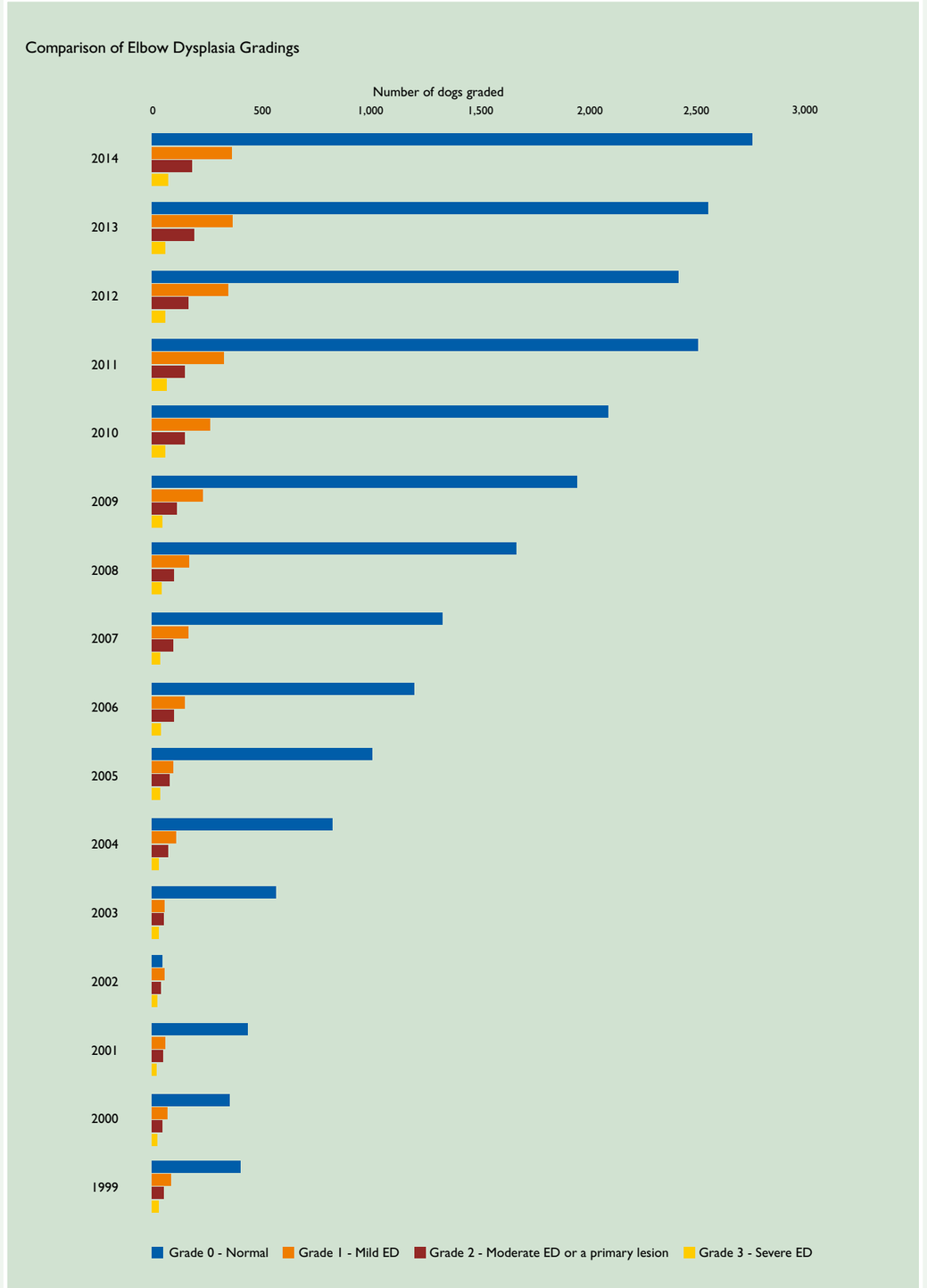


BVA/KC ELBOW DYSPLASIA SCHEME

Data Calculated to 01/01/2015

The following table contains the outcome of dogs scored under the scheme in the last 16 years and is broken down by year, number and percentage of dogs in each elbow grade. For further information by breed please refer to www.thekennelclub.org.uk/vets-researchers/dog-health-group-annual-report/

Year	Total dogs graded	Grades				
		0	> 0	1	2	3
2014	3380	2757 (81.6%)	623 (18.4%)	366 (10.8%)	183 (5.4%)	74 (2.2%)
2013	3181	2554 (80.3%)	627 (19.7%)	370 (11.6%)	194 (6.1%)	63 (2.0%)
2012	3000	2420 (80.7%)	580 (19.3%)	351 (11.7%)	168 (5.6%)	61 (2.0%)
2011	3059	2509 (82.0%)	550 (18%)	331 (10.8%)	152 (5.0%)	67 (2.2%)
2010	2575	2095 (81.4%)	480 (18.6%)	267 (10.4%)	152 (5.9%)	61 (2.4%)
2009	2351	1953 (83.1%)	398 (16.9%)	234 (10.0%)	116 (4.9%)	48 (2.0%)
2008	1993	1674 (84.0%)	319 (16%)	172 (8.6%)	101 (5.1%)	46 (2.3%)
2007	1639	1335 (81.5%)	304 (18.5%)	167 (10.2%)	99 (6.0%)	38 (2.3%)
2006	1501	1206 (80.3%)	295 (19.7%)	152 (10.1%)	100 (6.7%)	43 (2.9%)
2005	1229	1014 (82.5%)	215 (17.5%)	97 (7.9%)	81 (6.6%)	37 (3.0%)
2004	1046	828 (79.2%)	218 (20.8%)	111 (10.6%)	75 (7.2%)	32 (3.1%)
2003	714	570 (79.8%)	144 (20.2%)	57 (8.0%)	54 (7.6%)	33 (4.6%)
2002	598	471 (78.8%)	127 (21.2%)	59 (9.9%)	43 (7.2%)	25 (4.2%)
2001	578	441 (76.3%)	137 (23.7%)	62 (10.7%)	53 (9.2%)	22 (3.8%)
2000	503	359 (71.4%)	144 (28.6%)	70 (13.9%)	49 (9.7%)	25 (5.0%)
1999	583	408 (70.0%)	175 (30%)	89 (15.3%)	54 (9.3%)	32 (5.5%)



BVA/KC/ISDS EYE SCHEME

Data Calculated to 01/01/2015

The following table contains the results of eye examinations performed under schedule A of the scheme in the last 16 years and is broken down by year, number and percentage of dogs found to be affected. For further information by breed please refer to www.thekennelclub.org.uk/vets-researchers/dog-health-group-annual-report/

Year	Total Screened	Unaffected	Affected	CEA	TRD	CHC	PHPV	PPM	G	gPRA	cPRA	HC	PLL	RD
2014	12063	11879 (98.5%)	184 (1.5%)	22	1	0	0	0	37	3	0	121	0	0
2013	8977	8819 (98.2%)	158 (1.8%)	18	0	0	2	0	24	9	1	104	0	0
2012	12478	12329 (98.8%)	149 (1.2%)	13	0	0	1	0	32	5	2	96	1	0
2011	13844	13548 (97.9%)	296 (2.1%)	34	0	2	3	0	52	12	0	193	2	0
2010	14198	13926 (98.1%)	272 (1.9%)	28	0	0	6	0	47	11	1	178	2	0
2009	14915	14623 (98%)	292 (2%)	38	0	1	3	0	58	14	0	177	3	0
2008	13180	12825 (97.3%)	355 (2.7%)	36	1	0	0	0	69	17	0	237	0	0
2007	10363	10035 (96.8%)	328 (3.2%)	27	0	0	4	0	69	14	0	209	7	0
2006	9264	8874 (95.8%)	390 (4.2%)	37	0	1	6	1	59	17	1	268	8	0
2005	8571	8249 (96.2%)	322 (3.8%)	30	0	1	2	0	37	12	0	236	4	0
2004	8575	8241 (96.1%)	334 (3.9%)	25	0	1	2	1	53	18	1	229	6	0
2003	7780	7472 (96%)	308 (4%)	31	0	0	4	1	31	26	0	216	2	0
2002	7206	6881 (95.5%)	325 (4.5%)	43	0	0	4	1	45	18	2	214	2	0
2001	6480	6195 (95.6%)	285 (4.4%)	29	0	0	3	0	30	11	2	206	6	0
2000	7206	6881 (95.5%)	325 (4.5%)	43	0	0	4	1	45	18	2	214	2	0
1999	7520	7125 (94.7%)	395 (5.3%)	64	0	0	1	2	55	23	2	248	0	0

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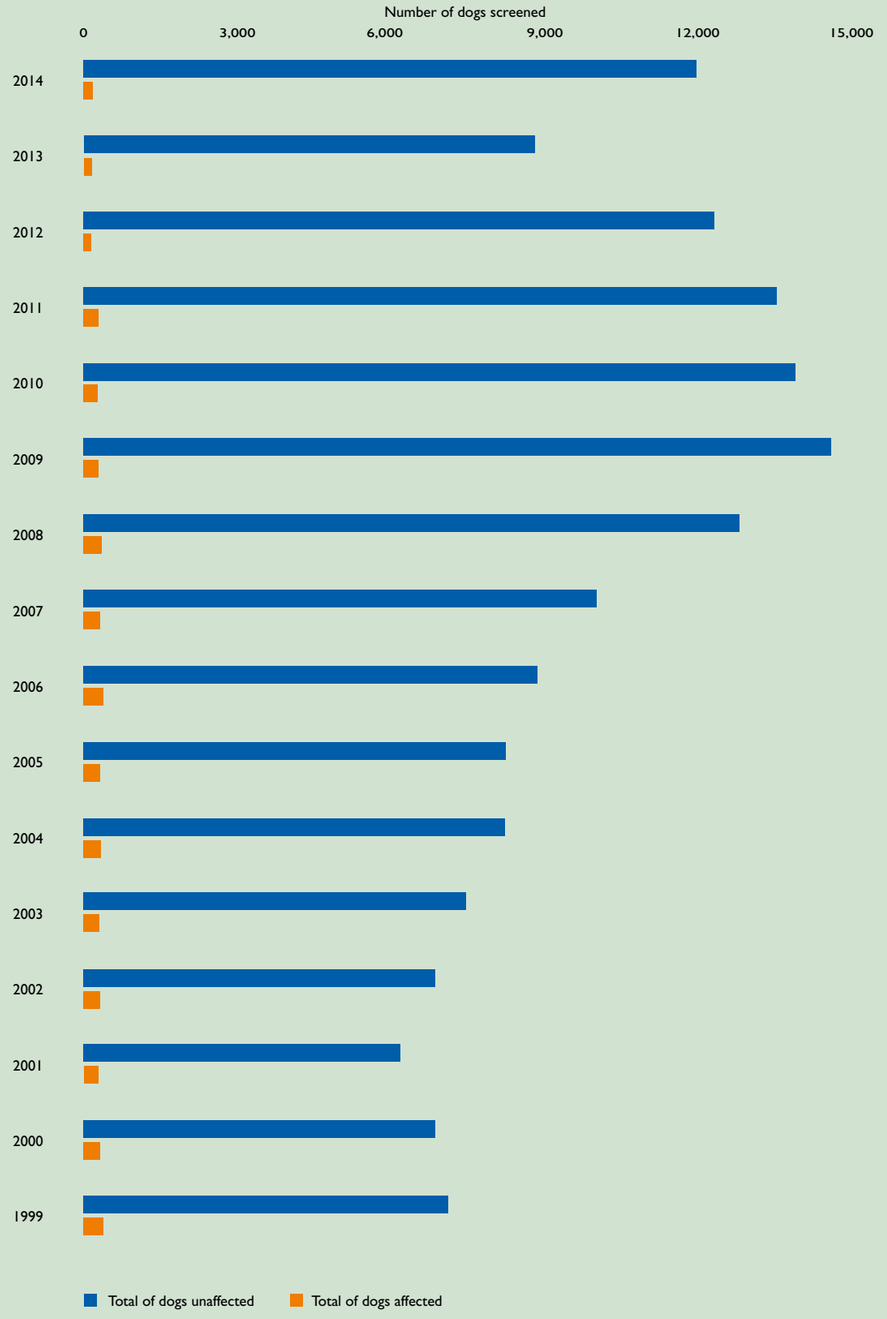
Breakdown of eye examination results into unaffected and affected figures



KENNEL CLUB DNA TESTING SCHEMES

Data Calculated to 01/01/2015

The following table contains the outcome of Kennel Club registered dogs tested under official Kennel Club DNA testing schemes in the last 15 years and is broken down by year and test result. Further data is presented to show the number of dogs born each year with a known hereditary status (i.e. both parents have been tested and the puppies health status is predictable). For further information by breed please refer to www.thekennelclub.org.uk/vets-researchers/dog-health-group-annual-report/

Year	DNA tested	Clear	Carrier	Affected	Dogs born with hereditary status known
2014	5464	4388 (80.3%)	978 (17.9%)	98 (1.8%)	35235
2013	5726	4710 (82.3%)	934 (16.3%)	82 (1.4%)	28802
2012	6862	5466 (79.7%)	1276 (18.6%)	120 (1.7%)	28837
2011	5392	3824 (70.9%)	1373 (25.5%)	195 (3.6%)	25654
2010	4571	3373 (73.8%)	1086 (23.8%)	112 (2.5%)	22597
2009	3989	2894 (72.5%)	974 (24.4%)	121 (3%)	17987
2008	3191	2486 (77.9%)	602 (18.9%)	103 (3.2%)	14817
2007	3278	2641 (80.6%)	554 (16.9%)	83 (2.5%)	11986
2006	2496	2112 (84.6%)	346 (13.9%)	38 (1.5%)	8522
2005	1189	940 (79.1%)	220 (18.5%)	29 (2.4%)	6072
2004	421	320 (76%)	96 (22.8%)	5 (1.2%)	4205
2003	549	398 (72.5%)	140 (25.5%)	11 (2%)	3146
2002	217	178 (82%)	38 (17.5%)	1 (0.5%)	2764
2001	319	241 (75.5%)	73 (22.9%)	5 (1.6%)	2274
2000	421	368 (87.4%)	52 (12.4%)	1 (0.2%)	2194

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BVA/KC CM/SM TESTING SCHEME SUMMARY BY BREED

Data Calculated to 01/11/2014

The following summary covers the results of all breeds that have had Kennel Club registered dogs CM/SM tested under the BVA/KC CM/SM testing scheme since the scheme began in 2012. This data is further broken down by test result.

Data revised in April 2015.

	Chiari-like malformation (CM) Grade			Syringomyelia (SM) Grade		
Breed	**0**	**1**	**2**	**0**	**1**	**2**
Affenpinscher						
A	0	2	2	2	1	1
B	0	2	3	5	0	0
C	0	5	5	7	1	2
Boston Terrier						
A	0	0	0	0	0	0
B	0	1	0	0	0	1
C	0	0	0	0	0	0
Cavalier King Charles Spaniel						
A	0	0	18	7	3	8
B	0	0	40	11	8	21
C	0	0	87	38	25	24
Chihuahua (Long coat)						
A	0	0	4	0	1	3
B	1	0	7	4	1	3
C	0	1	13	8	3	3
Chihuahua (Smooth coat)						
A	0	0	1	0	0	1
B	0	0	4	1	2	1
C	0	2	6	2	3	3
Griffon Bruxellois						
A	0	0	6	1	1	4
B	0	4	9	3	5	5
C	1	2	7	4	2	4
Papillon						
A	0	0	0	0	0	0
B	0	0	1	1	0	0
C	0	0	2	1	0	1
Pekingese						
A	0	0	0	0	0	0
B	0	1	0	1	0	0
C	0	0	0	0	0	0
Pomeranian						
A	0	0	0	0	0	0
B	0	2	0	1	0	1
C	0	3	2	3	2	0

Key

A = Aged 5 + B = Aged 3 – 5 C = Aged 1 – 3

Chiari-like malformation (CM)

Grade 0 No Chiari malformation
Grade 1 Cerebellum indented (not rounded)
Grade 2 Cerebellum impacted into, or herniated through the opening at the rear of the skull (the foramen magnum)

Syringomyelia (SM)

Grade 0 Normal (no central canal dilation, no presyrinx, no syrinx)
Grade 1 Central canal dilation (CCD) less than 2mm in diameter
Grade 2 Syringomyelia (central canal dilation which has an internal diameter of 2mm or greater), or separate syrinx, or pre-syrinx with or without central canal dilation

ANNEX B

COMPOSITION OF DOG HEALTH GROUP AND SUB-GROUPS

COMPOSITION OF THE DOG HEALTH GROUP

External	Mr Nick Blayney, *Veterinary surgeon*
	Prof. Sheila Crispin, *Veterinary surgeon with specialist expertise in comparative ophthalmology and systemic disorders with ocular manifestations*
	Mr Robin Hargreaves, *Veterinary surgeon, British Veterinary Association*
	Prof. Mike Herrtage, *Veterinary surgeon, Dean of University of Cambridge Veterinary School*
	Dr Sarah Blott, *Associate Professor in Animal Breeding and Genetics, University of Nottingham*
	Dr Cathryn Mellersh, *Canine Genetics Research Group Leader, Animal Health Trust*
	Dr Sally Everritt, *BSAVA Scientific Policy Officer*
Kennel Club Members	Mr Kevin Clifford, *Veterinary surgeon*
	Mr Frank Kane, *General Committee member and Chairman Breed Standards Sub-Committee*
	Mrs Gil Simpson, *General Committee member and Veterinary surgeon*
	Mr Mike Townsend, *Chairman Kennel Club Charitable Trust and Vice Chairman, Kennel Club*
Kennel Club Staff	Mrs Caroline Kisko, *Secretary/Director of Communications*
	Mr Bill Lambert, *Health and Breeder Services Manager*
	Mrs Caroline Hallett, *Registered Societies Manager*
	Ms Aimee Llewellyn, *Health Information Manager*

COMPOSITION OF THE GENETICS AND HEALTH SCREENING SUB-GROUP

External	Prof Neil Gorman, *Vice-Chancellor, Nottingham Trent University*
Canine Genetics	Dr Cathryn Mellersh, *Canine Genetics Research Group Leader, Animal Health Trust*
	Dr Susan Long, *University of Bristol, School of Veterinary Science*
Human Genetics	Prof. Bill Ollier, *Professor of Immunogenetics at Manchester University and Director of the Centre for Integrated Genomic Medical Research*
Canine Epidemiologist	Dr Dave Brodbelt, *Royal Veterinary College Lecturer in Companion Animal Epidemiology and a European Veterinary Specialist in Anaesthesia*
BVA nominated Veterinary Surgeons	Dr Ruth Dennis, *Head of Diagnostic Imaging Unit AHT and European Specialist in Veterinary Diagnostic Imaging, Chief Scrutineer BVA/KC Hip and Elbow Dysplasia schemes*
	Dr Ian Mason, *Chief Eye Panelist, BVA/KC Eye scheme*
Kennel Club Members	Mr Mike Townsend, *Chairman Kennel Club Charitable Trust*
	Dr Ron James, *General Committee member & Veterinary surgeon*
Kennel Club Staff	Mrs Caroline Kisko, *Secretary/Director of Communications*
	Ms Aimee Llewellyn, *Health Information Manager*
	Dr Tom Lewis, *Quantitative Geneticist*

COMPOSITION OF DOG HEALTH GROUP AND SUB-GROUPS

COMPOSITION OF THE BREED STANDARDS AND CONFORMATION SUB-GROUP

External	Prof. Sheila Crispin, *Veterinary surgeon with specialist expertise in comparative ophthalmology and systemic disorders with ocular manifestation*
	Prof. Mike Herrtage, *Veterinary surgeon, Dean of University of Cambridge Veterinary School*
Kennel Club Members	Mr Frank Kane, *General Committee member and Breed Standards Sub-Committee Chairman*
	Dr Ron James, *General Committee member and Veterinary surgeon*
	Mrs Meg Purnell-Carpenter, *General Committee member and Breed Standards Sub-Committee Vice-Chairman*
	Mr Ian Seath, *Kennel Club member*
Kennel Club Staff	Mrs Caroline Kisko, *Secretary/Director of Communications*
	Mr Bill Lambert, *Health and Breeder Services Manager*
	Mrs Kathryn Symns, *Executive, Canine Activities Department*
	Mrs Caroline Hallett, *Registered Societies Manager*
	Miss Charlotte McNamara, *Breed Health Co-ordinator*

COMPOSITION OF THE ASSURED BREEDER SCHEME SUB-GROUP

External	Mr Tony Buckwell, *Veterinary surgeon*
	Miss Annette Conn, *Behaviourist*
	Ms Sharon Edwards, *Trading Standards Authority Inspector*
	Mr Frank Geraghty, *Field Trial competitor & Assured Breeder*
	Mr Gavin Robertson, *Boarding kennel owner & Assured Breeder*
	Ms Philippa Robinson, *Canine Health Strategist*
	Mr Graham Thurlow, *Veterinary surgeon*
Kennel Club Member	Mrs Jan Wood, *General Committee member & Assured Breeder*
Kennel Club Staff	Mr Bill Lambert, *Health and Breeder Services Manager*
	Mr Glen Dymock, *Assured Breeder Scheme Manager*
	Ms Jacquie Easton, *Operations Executive*
	Mr Nick Sutton, *Health Information Officer*

COMPOSITION OF THE ACTIVITIES HEALTH AND WELFARE SUB-GROUP

External	Dr Jacqueline Boyd, *Lecturer/Senior Lecturer in Animal Science, School of Animal, Rural and Environmental Sciences, Nottingham Trent University*
	Mr Gary Doyle, *Lecturer School of Health, Sport and Bioscience, University of East London*
	Ms Lowri Davies, *Smart Clinic, Sports Medicine & Rehabilitation Therapy*
	Mrs Rachel Mowbray, *Kennel Club GB Agility Team Veterinary surgeon since 2008*
	Miss Caroline Tranquille, *Graduate Research Assistant, Equine Orthopaedic Research, the Animal Health Trust*
	Mr Barry Gilbert, *Working Trials*
	Mr Richard Curtis/Mrs Lesley Brocklehurst, *Heelwork to Music*
	Miss Natasha Wise, *Agility*
	Mr Robert Harlow, *Obedience*
Kennel Club Member	Mr Steve Croxford, *General Committee member, Activities Sub-Committee member, Disciplinary Sub-Committee Chairman*
Kennel Club Staff	Miss Debbie Deuchar, *Working Dog Activities Team Manager*
	Mr James Oxley, *Marketing Research Officer*
	Mrs Angela Mitchell, *Committee Secretary*

ANNEX C

REPORT FROM THE KENNEL CLUB GENETICS CENTRE AT THE ANIMAL HEALTH TRUST

During 2014 the Canine Genetics research team at the Kennel Club Genetics Centre (KCGC) at the Animal Health Trust (AHT) continued to investigate inherited disorders that are highlighted by breeders and/or veterinarians as health and welfare burdens for breeds at risk. We seek to identify the causal mutation(s) for each disorder and develop DNA tests that breeders can use to reduce the prevalence of the disorder in their breed and that veterinarians can use to facilitate diagnosis, prevention and treatment, where appropriate. Our research utilises DNA collected by a simple mouth swab from pet dogs, always with their owner's consent.

During 2014 we received DNA samples from approximately 2,320 dogs, of 115 different breeds, of which around 860 (~37%) were affected with an inherited disorder. Our DNA sample collection now comprises over 27,000 DNA samples, collected from over 180 different breeds, and represents an extremely valuable research resource.

NEW PROJECTS AND METHODOLOGIES

During 2014 we have initiated several new projects, investigating inherited diseases we have not previously studied and/or using new methodologies to identify disease mutations. These include:

- a study to identify genetic risk factors for idiopathic epilepsy in the Italian Spinone
- a study to identify the causal mutation for a newly described inherited eye disorder in Labrador Retrievers, called macular corneal dystrophy
- a new DNA test for primary open angle glaucoma in the Basset Griffon Vendeen (Petit)
- whole genome sequencing
- whole exome sequencing.

We are also continuing our investigations of the genetics of a wide variety of other inherited disorders in many different breeds, including hereditary cataract, progressive retinal atrophy, glaucoma, geographic retinal dysplasia, ataxia, sebaceous adenitis and steroid responsive meningitis. For a more complete summary of conditions under investigation please see our website: www.aht.org.uk/cms-display/genetics_cares.html.

Major outcomes from 2014 are summarised below.

WHOLE GENOME SEQUENCING

During 2014 the KCGC sequenced our first 10 *whole genomes*. This means we sequenced the whole genomes (all ~2.4 x 10^9 nucleotides of DNA) from 10 different dogs. Some of these dogs were healthy, older dogs and some were affected with an inherited disease. These whole genomes will serve two main purposes. Firstly, they can be screened for mutations associated with inherited disease, so may lead directly to the development of new DNA tests. Secondly, they can be used to exclude benign variants from having a disease association, thus expediting the search for a mutation. This has been a very exciting development and as the cost of whole genome sequencing continues to drop we hope to make more extensive use of this technique to identify mutations in the future.

WHOLE EXOME SEQUENCING

During 2014 the KCGC also sequenced our first whole exomes. The *exome* is the name given to the coding parts of all the genes in an individual. We sequenced the whole exomes of 36 dogs, representing 6 different breeds. Half of the dogs had progressive retinal atrophy (PRA) and half had healthy eyes. During 2015 we will analyse these data and hopefully identify mutations associated with PRA in at least some of these 6 breeds. We think exome sequencing will represent a very cost-effective method for identifying mutations associated with single gene diseases, allowing several breeds to be investigated in parallel.

MACULAR CORNEAL DYSTROPHY IN THE LABRADOR RETRIEVER

Macular corneal dystrophy (MCD) is a hereditary disease that can affect middle-aged Labrador Retrievers. Affected dogs develop cloudy eyes, due to an abnormal accumulation of glycosaminoglycans in their corneas. This disease is progressive, and although not painful, can cause marked visual impairment in affected dogs. The first case was identified in 2013 by a vigilant member of the ophthalmology team at the AHT and discussions with other ophthalmologists of this unique presentation led to the identification of a small number of additional cases. One of the AHT's ophthalmologists undertook a research project, alongside Kennel Club Genetics Centre staff, to find the causal mutation. The project was successful and we have been able to make the DNA test available. This newly emerging disease, which is caused by a recessive mutation, can now be stopped in its tracks before the mutation has a chance to become more widespread and before any more dogs suffer impaired vision as a result.

PRIMARY OPEN ANGLE GLAUCOMA IN THE BASSET GRIFFON VENDEEN (PETIT)

Primary glaucoma is a painful and blinding disease associated with pathologically high intraocular pressure. The fluid inside the eye (the aqueous humour) is produced in the ciliary body which is located behind the iris. This fluid flows through the pupil and drains from the eye through a sieve-like network located at the junction of the cornea and the iris called the iridocorneal angle. Glaucoma occurs as a consequence of inadequate outflow of aqueous humour and a subsequent build up of pressure inside the eye that damages the optic nerve and results in blindness. In primary open angle glaucoma (POAG), the opening to the iridocorneal angle appears normal and is open to the flow of aqueous humour. It is thought that the impairment of aqueous outflow is due to a defect deep within the iridocorneal angle.

Towards the end of 2014, after several years of work using DNA samples provided by many supportive owners and breeders, Kennel Club Genetics Centre staff at the AHT identified the mutation that causes POAG in the Petit Basset Griffon Vendeen. A DNA test will be launched in March 2015.

SUMMARY OF DNA TESTING STATISTICS

Since 2009, when the Kennel Club commenced funding of the Canine Genetics Centre at the Animal Health Trust, DNA tests have been developed for eleven different disease mutations that are relevant to 31 different breeds of dog, with six breeds benefitting from more than one test. In total the AHT has now tested over 45,800 dogs for these ten mutations, over 8,600 of which were tested during 2014. Importantly, the tests have identified 9,900 dogs that are carriers of at least one disease mutation. In the absence of DNA tests it would have been impossible to determine whether the vast majority of these dogs were carrying these mutations or not, meaning they might have been innocently bred to other carriers and given rise to affected offspring.

ACKNOWLEDGEMENTS

The Kennel Club Genetics Centre at the Animal Health Trust is generously supported by the Kennel Club. We also gratefully acknowledge additional funding from PetPlan Charitable Trust, Dogs Trust, Waltham Foundation, Breed Clubs and individuals.

ANNEX D

REPORT FROM THE KENNEL CLUB CANCER CENTRE AT THE ANIMAL HEALTH TRUST

CLINICAL UPDATE:

Since opening its doors in early 2013, the Kennel Club Cancer Centre at the Animal Health Trust (AHT) has treated more patients than it anticipated. More than 1,300 radiation doses have been administered to over 130 individual dogs, from more than 20 breeds with 15 different types of cancer. 2015 looks set to be the busiest year yet, as the centre's reputation grows and its caseload increases.

Dog breeds which have benefitted from the AHT's clinical cancer expertise and the state-of-the-art facilities available in the new Centre, include the Border Collie, Boxer, Bullmastiff, Dobermann, Bull Terrier, Cocker Spaniel, English Springer Spaniel, Golden Retriever, Greyhound, Labrador Retriever, Pug, Scottish Terrier, Staffordshire Bull Terrier, Weimaraner and Whippet. 2014 also saw the centre commence the treatment of horses using high dose radiation for treatment of multiple different tumour types.

The Kennel Club Cancer Centre is able to offer each and every patient the specific treatment for its specific cancer. Being able to combine surgery with chemotherapy and / or radiotherapy on one site is far better and less stressful. In addition, through treating these animals, the Kennel Club Cancer Centre at the AHT is able to gather information which will contribute to on-going cancer research.

In time these patients may indirectly help improve cancer treatments for other dogs across the world. By collecting DNA samples, every cancer case treated at the AHT contributes towards clinical and genetic research projects, helping the AHT to better understand the disease and find ways to more accurately diagnose and treat it in the future.

CANCER RESEARCH UPDATE:

The AHT is actively researching cancer in dogs in many ways. Clinical oncologists undertake research projects designed to improve the clinical understanding, treatment and diagnosis of cancer, partly informed by the cases treated in the Kennel Club Cancer Centre. At the same time, molecular biologists are making progress in understanding the nature of different cancers by studying the molecular make up of tumours. Investigations are also underway to try and understand more about the inherited risk factors for specific cancers in certain breeds.

A prominent area of cancer research at the AHT is the development of more reliable prognostic tests for cancers in dogs. This research has the potential to benefit dogs of all breeds that develop the tumours currently being investigated. It is extremely important for veterinarians to be able to accurately predict how a tumour will behave; e.g. if it will spread, and whether a tumour will respond to treatment. Therefore, the results obtained from a reliable prognostic test would have considerable health and welfare benefits for the dog in assisting an oncologist to determine the most appropriate treatment method and more accurately advising the owner on the dog's prognosis.

In 2014, AHT researchers began a study on uveal melanomas, the most common primary tumour of the eye in dogs. The study aims to identify 'molecular biomarkers' which predict whether uveal melanomas will spread from the eye. Presently the only way to predict whether a uveal melanoma will spread is to remove the eye, or a significant surgical section, for examination by a pathologist. A consequence of this is that eyes are sometimes unnecessarily removed from dogs found to have 'benign' tumours.

The AHT research study has compared the 'molecular fingerprints' of uveal melanomas that spread from the eye with those of tumours that did not spread from the eye, and several 'molecules' have been identified that show differences between the two groups of tumours. Hopefully the identification of these 'biomarkers' is a substantial first step towards the development of a new prognostic test for canine uveal melanomas.

In addition, the AHT's uveal melanoma research is significant in demonstrating the use in cancer research of tumour biopsies which were originally collected for histopathological examinations, but have subsequently been held in storage archives. The 'molecular profiling' of these archival tumour biopsies has only been possible through access to the GeneAtlas System, funded by a grant from the Kennel Club Charitable Trust. The capability to perform genetic analyses on archival tumour specimens has major implications for future research studies that will now be possible.

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